

# Problem-Solving Cycle Activity

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<b>Purpose</b>	To get all staff involved in thinking through a problem before jumping to solutions. This activity can also result in a comprehensive data analysis design. By starting with hunches and hypotheses, all staff can get their voices out on the table. When voices are expressed, there is a better chance of all staff using the information later. (The first three steps in the problem-solving cycle are <i>key</i> and the focus of this activity.)
<b>Target Audience</b>	All staff
<b>Time</b>	One hour for the first three steps of the cycle
<b>Materials</b>	Chart pad paper, masking tape, tacks, and markers. Handouts for each participant: problem-solving cycle and questions worksheet.

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<b>Process Protocol</b>	<p>Make sure each person has a copy of the handout and that you are prepared to help small groups identify their problem in objective terms. You will need about one hour to get through the first three steps, if getting the data analysis is your focus. Analyzing the data will take another two hours—probably at a different time (see Chapter 4 activities). Developing the action plan will take days with small groups going back to the larger group (see Action Planning Activity). Implementing the action plan is the ongoing work of the school, as is evaluating the implementation of the action plan and improving the processes.</p> <ol style="list-style-type: none"><li>1. Establish the size of the group(s) that will be going through this activity. Small groups are beneficial in allowing everyone to participate, even if groups are working on the same problem.</li><li>2. Start out with guidelines or ground rules of acceptable and unacceptable behavior, and how they will be monitored. Make sure it is a “safe” room for threat-free, honest, open discussion.</li><li>3. Have each group clearly identify a problem to be solved, stated in objective terms. For example, <i>Not all students are reading at grade level by grade three</i>, as opposed to, <i>40 percent of our students are not capable of reading by grade three</i>. The problem should let you find the data.</li><li>4. Brainstorm hunches and hypotheses about why the problem exists (takes about ten minutes). This can spell out</li></ol>
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what teachers are thinking about the problem currently. At this point, you could use a “cause and effect diagram.”

5. Considering the problem, identify questions that need to be answered to find out more about the problem (e.g., How many students have not been reading on grade level by grade three for the past three years?)
6. For each question, determine the data that need to be gathered to answer the question. This list becomes the data analysis. Eye-balling this list, one can see that for the most part, the data will fall into the four categories of demographics, student learning, perceptions, and school processes. (At this point, you should have uncovered new ways of looking at the problem. This might be as far as you go on this day.)
7. Have the groups share their problem-solving cycle, letting others add to it, if appropriate.
8. Gather and analyze the data. This is often where the schools have the most trouble because they do not have the data available. Help them get the data that they ask for above.
9. Continue with the problem-solving cycle through action planning and implementation (see other activities).

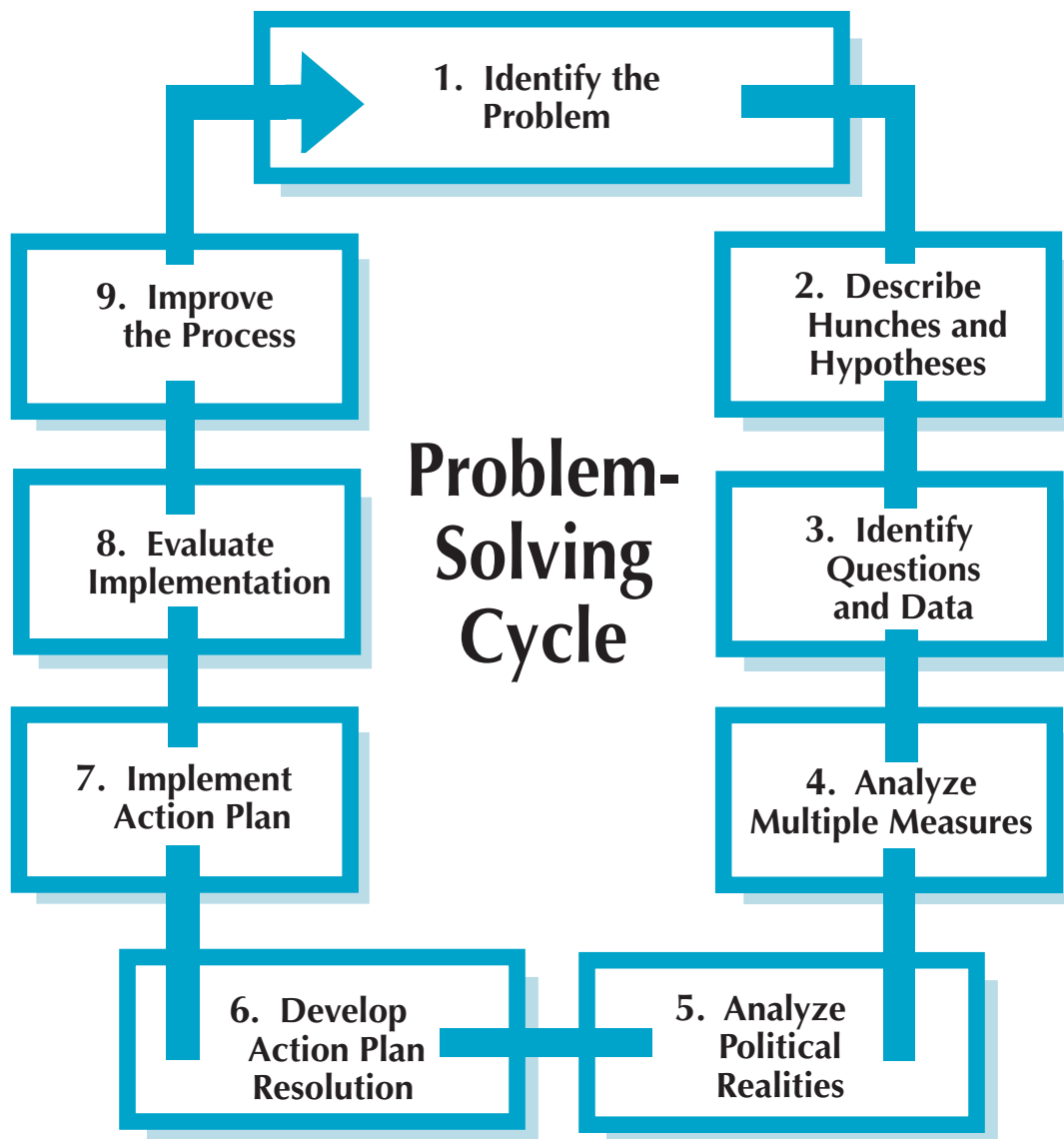
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## Comments to the Facilitator

This whole process, along with examples, is shown in *Data Analysis for Comprehensive Schoolwide Improvement* (Bernhardt, 1998), beginning on page 144. The first three steps are important for getting the data analysis established—the focus of this activity.

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*Note.* From *Data Analysis for Comprehensive Schoolwide Improvement* (p.144), by Victoria L. Bernhardt, 1998, Larchmont, NY: Eye on Education. Copyright © 1998 Eye on Education, Inc. Reprinted with permission.

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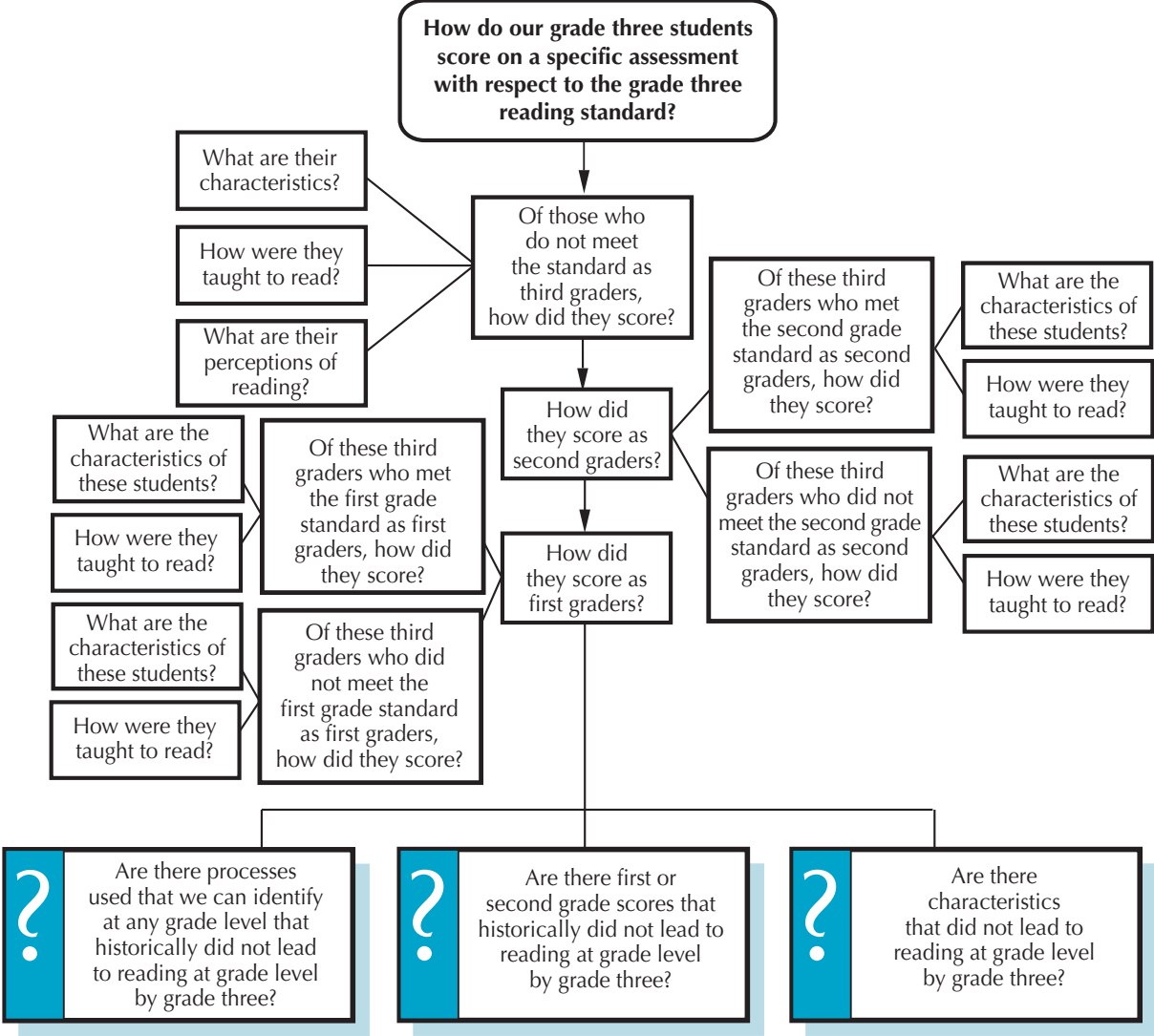
<b>Identify the problem:</b>
<b>List hunches and hypotheses about why the problem exists.</b>

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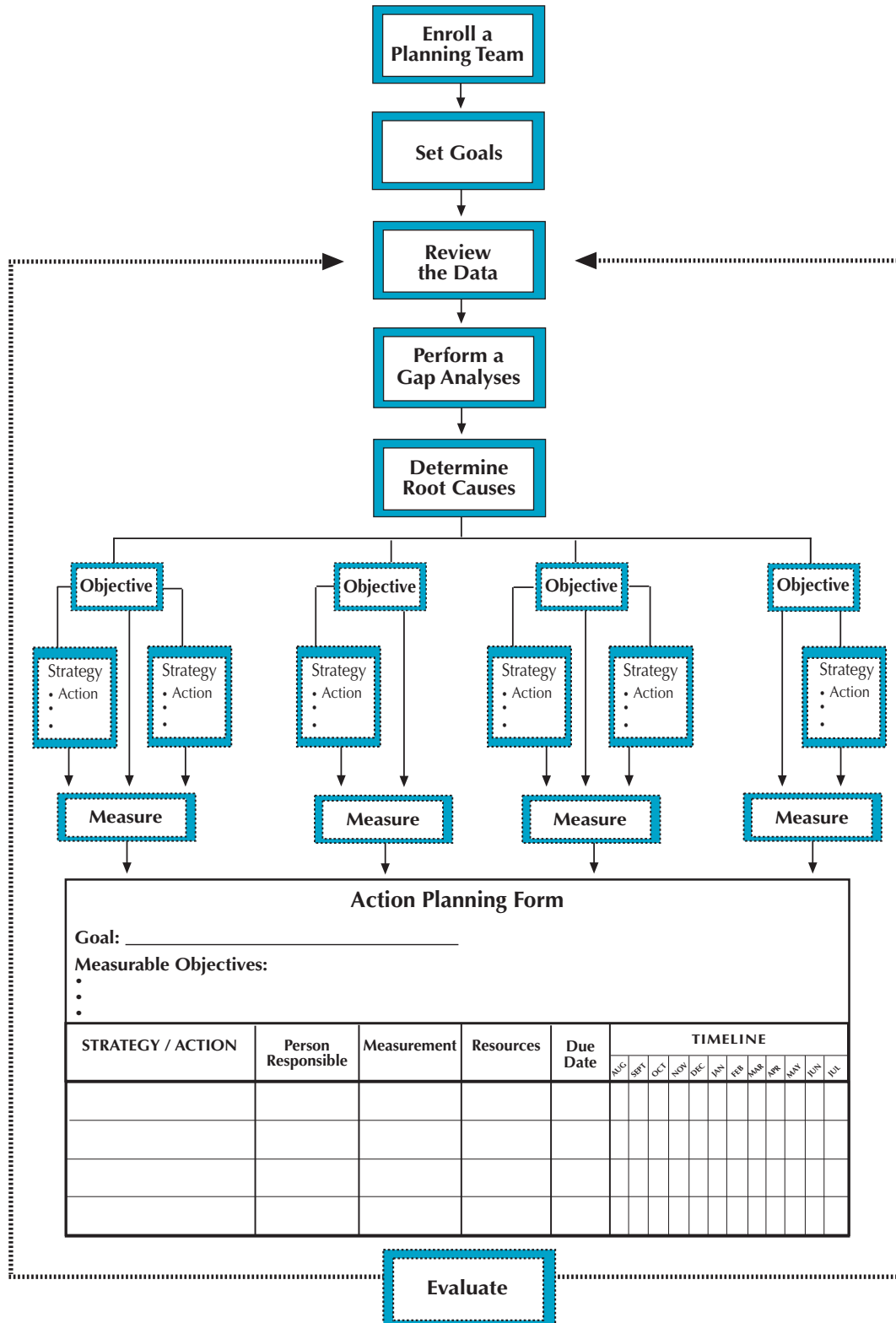
What questions do you need to answer to know more about the problem?	What data do you need to gather?

	Analyzing a Reading Standard: Grade Three	
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*Note.* From *The School Portfolio Toolkit: A Planning, Implementation, and Evaluation Guide for Continuous School Improvement*, by Victoria L. Bernhardt, 2002, Larchmont, NY: Eye on Education. Copyright © 2002 Eye on Education, Inc. Reprinted with permission.

# Creating an Action Plan



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# Multiple Measures

*by Victoria L. Bernhardt*

Let's talk about multiple measures. Many state and federal regulations now require schools to report multiple measures — multiple measures of student achievement, that is. While we applaud these changes from the old method of using one standardized achievement score to make decisions about how well a school is doing, multiple measures of student learning alone are not sufficient for comprehensive school improvement, and, in fact, can be misleading in this regard.

Many educators believe that over 50 percent of student achievement results can be explained by *other factors*. That being true, if we want to change the results we are getting, we have to understand the other 50 percent to know why we are getting the results we are getting. Then we need to change what we do in order to get different results.

Any definition of multiple measures should include *four* major measures of data — not just student learning, but also demographics, perceptions, and school processes. Analyses of *demographics, perceptions, student learning, and school processes* provide a powerful picture that will help us understand the school's impact on student achievement. When used together, these measures give

schools the information they need to improve teaching and learning to get positive results.

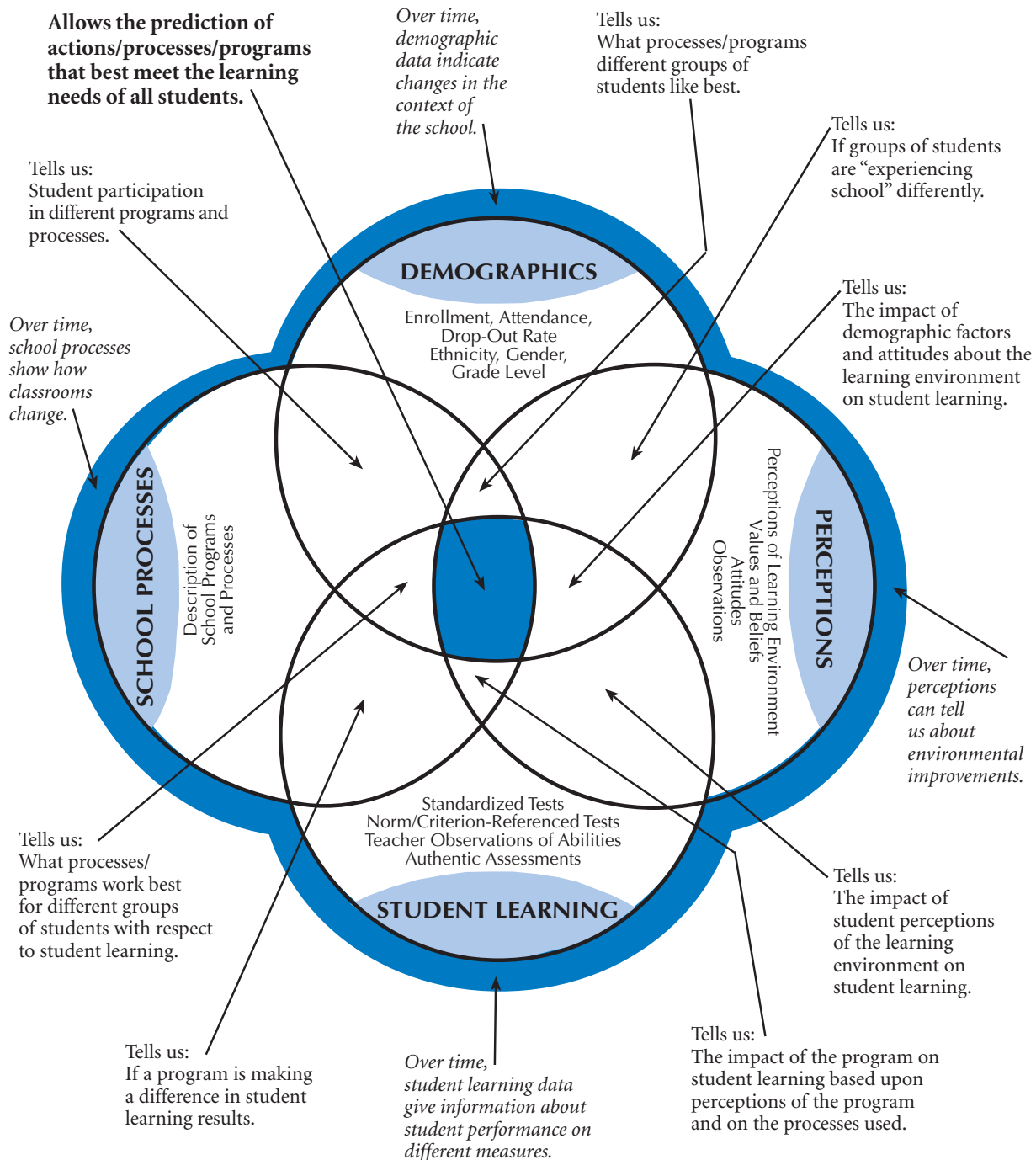
In the figure that follows, the four major measures are shown as overlapping circles. The figure illustrates the type of information that one can gain from individual measures and the enhanced levels of analyses that can be gained from the intersections of the measures.

One measure by itself gives useful information. Comprehensive measures, used together and over time, provide much richer information. Ultimately, schools need to be able to predict what we must do to meet the needs of *all* students they have, or will have in the future. The information gleaned from the intersections of these four measures (demographics, perceptions, student learning, and school processes) helps us to define the questions we want to ask, and focuses us on what data are necessary in order to find the answers.

*Demographic* data provide descriptive information about the school community, such as enrollment, attendance, grade level, ethnicity, gender, and native language. Demographic data are very important for us to understand. They are the part of our educational system over which we have little



# MULTIPLE MEASURES OF DATA



*Note.* Adapted from *Data Analysis for Comprehensive Schoolwide Improvement* (p.15), by Victoria L. Bernhardt, 1998, Larchmont, NY: Eye on Education. Copyright © 1998 Eye on Education, Inc. Reprinted with permission.

Bernhardt, V. L. (1998, March) Invited Monograph No. 4. *California Association for Supervision and Curriculum Development (CASCD)*.

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or no control, but with which we can observe trends and glean information for purposes of prediction and planning. Demographic data assist us in understanding the results of all parts of our educational system through the disaggregation of other measures by demographic variables.

*Perceptions* data help us understand what students, parents, teachers, and others think about the learning environment. Perceptions can be gathered in a variety of ways—through questionnaires, interviews, and observations. Perceptions are important since people act in congruence with what they believe, perceive, or think about different topics. It is important to know student, teacher, and parent perceptions of the school so school personnel know what they can do to improve the system. Perceptions data can also tell us what is possible.

*Student Learning* describes the results of our educational system in terms of standardized test results, grade point averages, standards assessments, and authentic assessments. Schools use a variety of student learning measurements—usually separately—and sometimes without thinking about how these measurements are interrelated. Schools normally think of multiple measures as looking only at different measures of student learning, rather than including demographics, perceptions, and school processes.

*School Processes* define what teachers are

doing to get the results that we are getting. For example, how is reading being taught at grade two, or math at grade six? School Processes include programs, instructional strategies, and classroom practices. This is the measure that seems to be the hardest for teachers to describe. Most often, teachers say they do what they do intuitively, and that they are too busy doing whatever they do to systematically document and reflect on their processes. To change the results schools are getting, teachers and school personnel must begin to document these processes and align them with the results they are getting in order to understand what to change to get different results, and to share their successes with others.

### A Snapshot of the Measures

Looking at each of the four measures separately, we get snapshots of data in isolation from any other data at the school level. At this level we can answer questions such as—

- How many students are enrolled in the school this year?  
(*Demographics*)
- How satisfied are parents, students, and/or staff with the learning environment?  
(*Perceptions*)
- How did students at the school score on a test? (Student *Learning*)
- What programs are operating in the school this year? (*School Processes*)

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By looking over time we can answer questions such as, but not limited to:

- How has enrollment in the school changed over the past five years? (*Demographics*)
- How have student perceptions of the learning environment changed, over time? (*Perceptions*)
- Are there differences in student scores on standardized tests over the years? (*Student Learning*)
- What programs have operated in the school in the past five years? (*School Processes*)

### Intersection of Two Measures

Crossing two measures, we begin to see a much more vivid picture of the school, allowing us to answer questions such as:

- Do students who attend school every day perform better on the state assessment than students who miss more than five days per month? (*Demographics by Student Learning*)
- What strategies do third-grade teachers use with students whose native languages are different from that of the teacher? (*Demographics by School Processes*)
- Is there a gender difference in students' perceptions of the learning environment? (*Perceptions by Demographics*)
- Do students with positive attitudes about school do better

academically, as measured by the state assessment? (*Perceptions by Student Learning*)

- Are there differences in how students enrolled in different programs perceive the learning environment? (*Perceptions by School Processes*)
- Do students who were enrolled in active hands-on content courses this year perform better on standardized achievement tests than those who took the content courses in a more traditional manner? (*Student Learning by School Processes*)

Looking at the interaction of two of the measures over time allows us to see trends as they develop (e.g., standardized achievement scores disaggregated by ethnicity over the past three years can help us see if the equality of scores, by ethnicity, is truly a trend or an initial fluctuation.) This interaction also begins to show the relationship of the multiple measures and why it is so important to look at all the measures together.

### Intersection of Three Measures

As we intersect three of the measures at the school level (e.g., student learning measures disaggregated by ethnicity compared to student questionnaire responses disaggregated by ethnicity,) the types of questions that we are able to answer include the following:

- Do students of different ethnicities perceive the learning environment differently, and are their scores on standardized achievement tests consistent with these perceptions?  
(*Demographics by Perceptions by Student Learning*)
- What instructional process(es) did the previously non-English-speaking students enjoy most in their all-English classrooms this year?  
(*Perceptions by Demographics by School Processes*)
- Is there a difference in students' reports of what they like most about the school by whether or not they participate in extracurricular activities? Do these students have higher grade point averages than students who do not participate in extracurricular activities?  
(*Perceptions by Student Learning by School Processes*)
- Which program is making the biggest difference with respect to student achievement for at-risk students this year, and is one group of students responding "better" to the processes?  
(*School Processes by Student Learning by Demographics*)

Looking at three measures over time allows us to see trends, to begin to understand the learning environment from the students' perspectives, and to know how to deliver

instruction to get the desired results from and for *all* students.

### Intersection of Four Measures

Our ultimate analysis is the intersection of all four measures, at the school level (e.g., standardized achievement tests disaggregated by program, by gender, within grade level, compared to questionnaire results for students by program, by gender, within grade level.) These interactions allow us to answer such questions like:

- Are there differences in achievement scores for 8th grade girls and boys who report that they like school, by the type of program and grade level in which they are enrolled?  
(*Demographics by Perceptions by School Processes by Student Learning*)

It is not until we intersect all four circles, at the school level, and over time that we are able to answer questions that will predict if the actions, processes, and programs that we are establishing will meet the needs of *all* students. With this intersection, we can answer the ultimate question:

- Based on whom we have as students and how they prefer to learn, and what programs they are in, are all students learning at the same rate?  
(*Student Learning by Demographics by Perceptions by School Processes*)

## Focusing the Data

Data analysis should not be about gathering data. It is very easy to get “analysis paralysis” by spending time pulling data together and not spending time using the data. School level data analysis should be about helping schools understand if they are achieving their purpose and guiding principles and meeting the needs of *all* students—and, if not, why not? A good way to avoid *analysis paralysis* is to consider using *key questions* and building your analyses around the answers to these questions.

This type of data analysis is easy when schools are clear on their purpose and what they expect students to know and be able to do. These analyses comfortably flow from questions that teachers and administrators naturally ask themselves to learn if these purposes are being met. The good news is that by looking at trends of the intersected four major measures, schools do not have to conduct complicated program evaluations or needs analyses. These intersections can tell them just about everything they would want to know, and the data are fairly readily available.

## Summary

The moral of the story is, if we want to get different results, we have to change the processes that create the results. Just looking at student achievement measures focuses teachers only on the results, it does not give them information about what they need to do to get different results.

By asking for student achievement measures alone, state and federal program officers can never use these data because the *context* is missing. This request might also mislead schools into thinking they are analyzing student learning in a comprehensive fashion. Just looking at student learning measures could in fact keep teachers from progressing and truly meeting the needs of students.

When we focus only on student learning measures, we see school personnel using their time figuring out how to look better on the student learning measures. We want school personnel to use their time figuring out how to *be* better for *all* students.

## About the Author

Victoria L. Bernhardt, Ph. D., is Executive Director of the Education for the Future Initiative, a not-for-profit organization whose mission is to build the capacity of all schools at all levels to gather, analyze, and use data to continuously improve learning for all students. She is also Professor in the Department of Professional Studies in Education, College of Communications and Education, at California State University, Chico.

Under her leadership, the Education for the Future Initiative has received dozens of awards, including being named one of the top business-education partnerships in the world when it received the NOVA Corporation Global Best Award for Educational Renewal and Economic Development in 1996.

The author's first book, *The School Portfolio: A Comprehensive Framework for School Improvement* (Second Edition, 1999) assists schools with clarifying the purpose and vision of their learning organizations as they develop their school portfolios. *Data Analysis for Comprehensive Schoolwide Improvement* (1998) helps learning organizations use data analysis to determine where they are, where they want to be, and how to get there — sensibly, painlessly, and effectively; and *The Example School Portfolio* (2000) shows what a completed school portfolio looks like and further supports schools in developing their own school portfolios. *Designing and Using Databases for School Improvement* (2000) helps schools and districts think through the issues surrounding the creation and uses of databases established to achieve improved student learning. *The School Portfolio Toolkit: A Planning, Implementation, and Evaluation Guide for Continuous School Improvement*, and CD-Rom (2002), is a compilation of over 300 ideas, examples, suggestions, activities, tools, strategies, and templates for producing school portfolios that will lead to continuous school improvement.

Dr. Bernhardt is passionate about her mission of helping all educators continuously improve their classrooms, their schools, their districts, and states by gathering and analyzing actual data—as opposed to using hunches and “gut level” feelings. She has made numerous presentations at professional meetings and has conducted thousands of workshops on the school portfolio, data analysis, and school improvement at local, state, regional, national, and international levels.

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